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**Suggested Session Title:**  
Optical and Magnetic Properties  
of YBCO Related Structures

**Classification Scheme:**

12g

**Raman Study of Pr doped  $\text{Eu}_{1.5}\text{Ce}_{0.5}\text{Sr}_2\text{Cu}_2\text{MO}_{10}$  (M = Nb and Ta) High  $T_C$  Superconductors,\*** -- M. J. BENNAHMIA<sup>1,2</sup>, H. B. RADOUSKY<sup>2,3</sup>, H. E. LORENZANA<sup>2</sup>, T.J. GOODWIN<sup>3</sup>, AND R.N. SHELTON<sup>3</sup>, <sup>1</sup>UC-Davis, Dept. of Applied Science, Livermore, CA 94551, <sup>2</sup>Lawrence Livermore National Laboratory, Livermore, CA 94551, <sup>3</sup>UC-Davis, Dept. of Physics, Davis, CA 95616 --  $\text{Pr}_{1.5}\text{Ce}_{0.5}\text{Sr}_2\text{Cu}_2\text{MO}_{10}$  ( $\text{PrCeSCMO}$ ) (M = Nb and Ta) are insulating analogs to the family of cuprate-niobate superconducting compounds  $\text{RCeSCNO}$  (R = Eu, Sm, and Nd) with  $T_C$ 's near 28 K.<sup>1</sup> Raman characterization has been performed on a wide range of  $(\text{Eu}_{1.5-x}\text{Pr}_x)\text{CeSCMO}$  (M = Nb and Ta ;  $0 < x < 1.5$ ) compounds. The phase diagram for these compounds indicates that for  $x < 0.3$  the compounds are superconducting and for  $x > 0.6$  complex magnetic behavior is observed. The line assignments for these Raman spectra are similar to the parent compound  $\text{RBa}_2\text{Cu}_3\text{O}_7$ . The origin of the broadening of the Raman peaks upon Pr doping will be discussed in terms of disorder within the  $\text{CuO}$  planes. The effect of this disorder on promoting the weak ferromagnetism seen in these materials will also be briefly discussed.

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[1]. T.J. Goodwin, H. B. Radousky and R. N. Shelton, Physica C 204, 212 (1992).